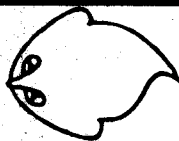


Williams®

16P-3003-101
Game No. 3003
November, 1981



DRAWING SET (Upright)



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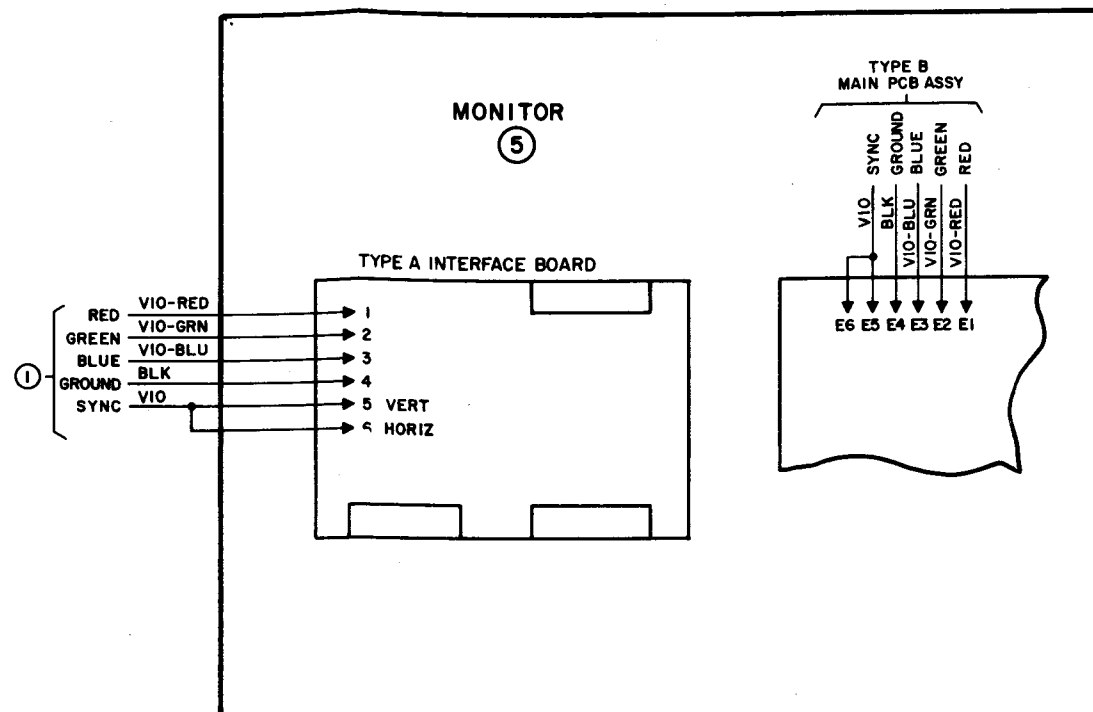
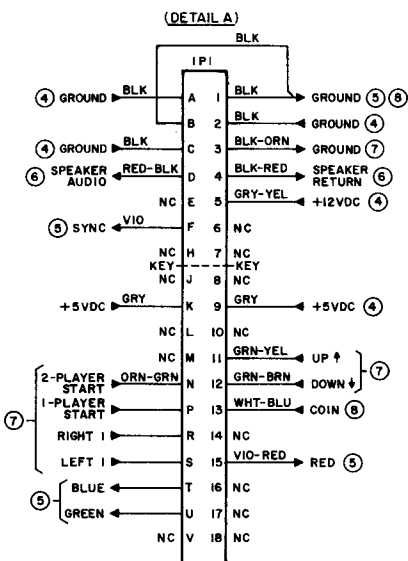
Williams® 
ELECTRONICS, INC.

3401 N. California Ave., Chicago, IL 60618
Cable Address: WILCOIN, CHICAGO
(312) 267-2240

CONTENTS

Interboard Wiring Diagram.	3
R8948 CPU Board Assembly Drawing	4
CPU Board Logic Diagram (Sheet 1 of 3)	5
CPU Board Logic Diagram (Sheet 2 of 3)	6
CPU Board Logic Diagram (Sheet 3 of 3)	7
Power Supply Board Assembly Drawing	8
Power Supply Board Schematic Diagram and Overvoltage Protection Board	9
Power Panel Assembly Drawing	10
Power Wiring Diagram	11
Cabinet Wiring Diagram	12

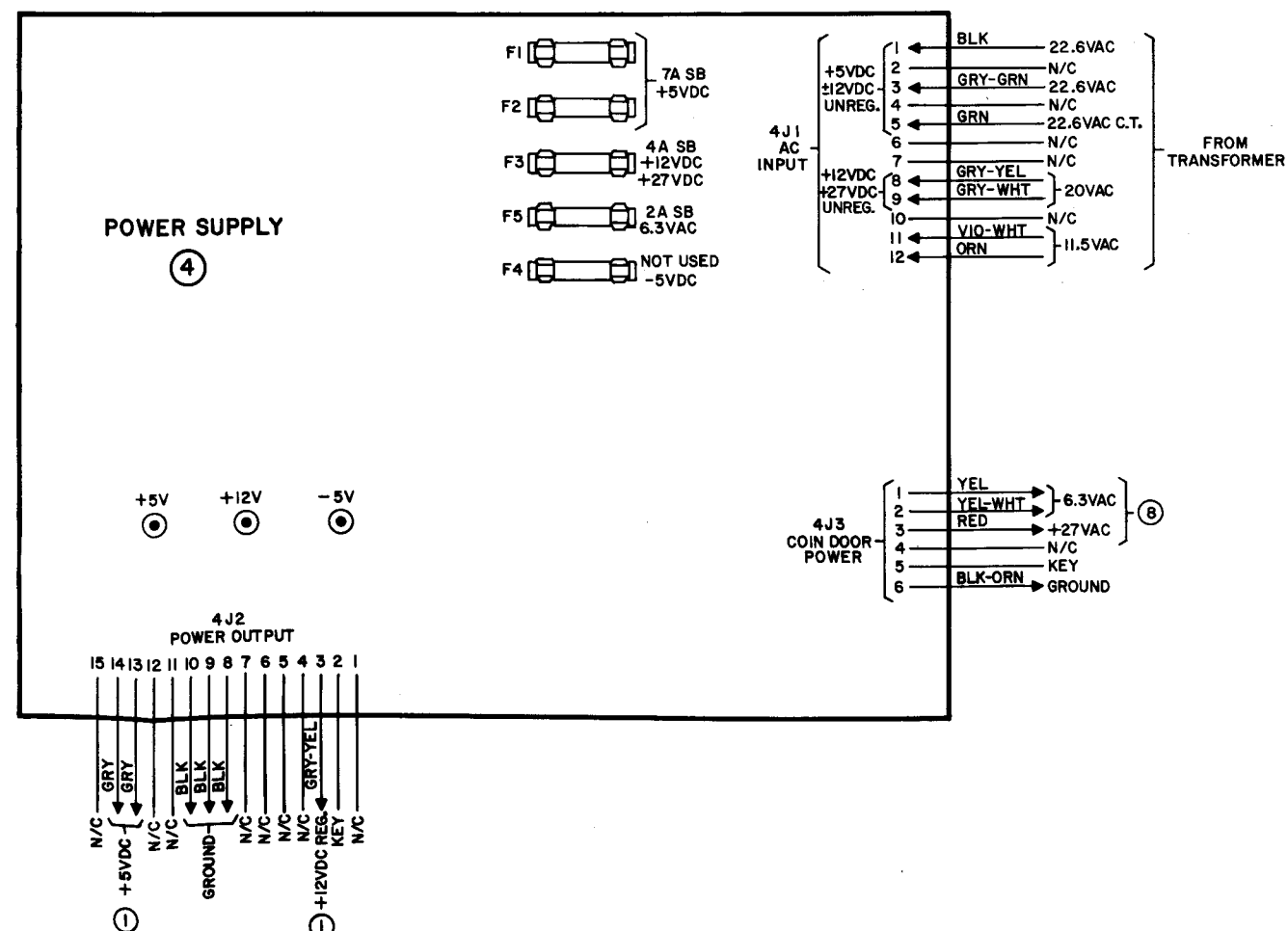
- ① CPU BOARD
- ② NOT ASSIGNED
- ③ NOT ASSIGNED
- ④ NOT ASSIGNED
- ⑤ MONITOR
- ⑥ CABINET
- ⑦ PLAYER PANEL
- ⑧ COIN DOOR



(DETAIL B)
SWITCH NUMBER

ADJUSTMENT	1	2	3	4	5	6	7	**8
*RECOMMENDED	OFF	ON	ON	ON	ON	OFF	ON	OFF
1 PLAY/2 COINS	OFF	OFF						
2 PLAYS/1 COIN	ON	OFF						
*1 PLAY/1 COIN	OFF	ON						
FREE PLAY	ON	ON						
6 BRUSHES			OFF	OFF				
5 BRUSHES			ON	OFF				
4 BRUSHES			OFF	ON				
*3 BRUSHES			ON	ON				
FIRST PATTERN EASY					OFF			
*FIRST PATTERN DIFFICULT					ON			
*WARP HOLE DISABLED						OFF		
WARP HOLE ENABLED						ON		
TABLE GAME							OFF	
UPRIGHT							ON	

** SET SWITCH 8 TO ON TO FREEZE PATTERN
FOR MONITOR ADJUSTMENTS.



A ← THRU → U
01 ← THRU → 160

4R 4C00
(D4-D7)
SCRATCH RAM

4P 4400
(D4-D7)
COLOR RAM

4N 4000
(D4-D7)
CHARACTER
RAM

4M 4C00
(D0-D3)
SCRATCH RAM

4L 4400
(D0-D3)
COLOR RAM

4K 4000
(D0-D3)
CHARACTER
RAM

6P
SPECIAL

① CPU BOARD

6J
ROM 4

6H
ROM 3

6F
ROM 2

6E
ROM 1

7F
COLOR ROM

5F
ROM B
CHARACTERS

5E
ROM A
MAZE

2 4 6 8
9D SWITCH
ADJUST
(DETAIL B)

VOLUME
CONTROL

4A
VIDEO ROM

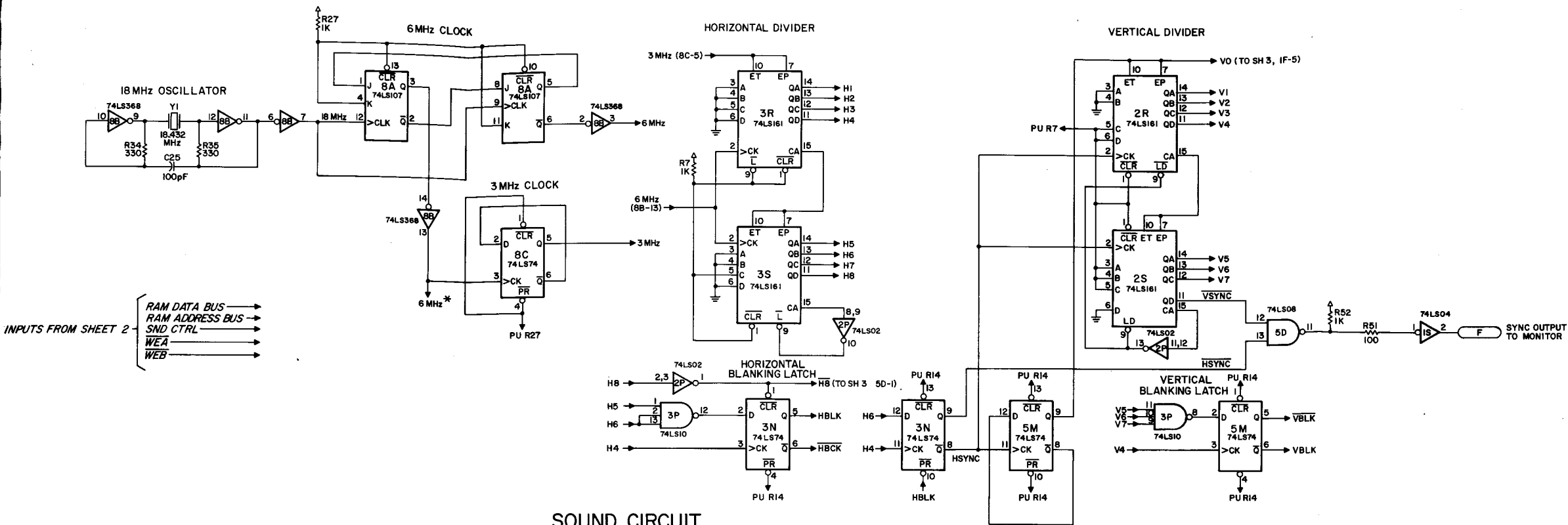
6A
Z-80 MPU

1M
SOUND
WAVEFORM
ROM

3M
SOUND
TIMING ROM

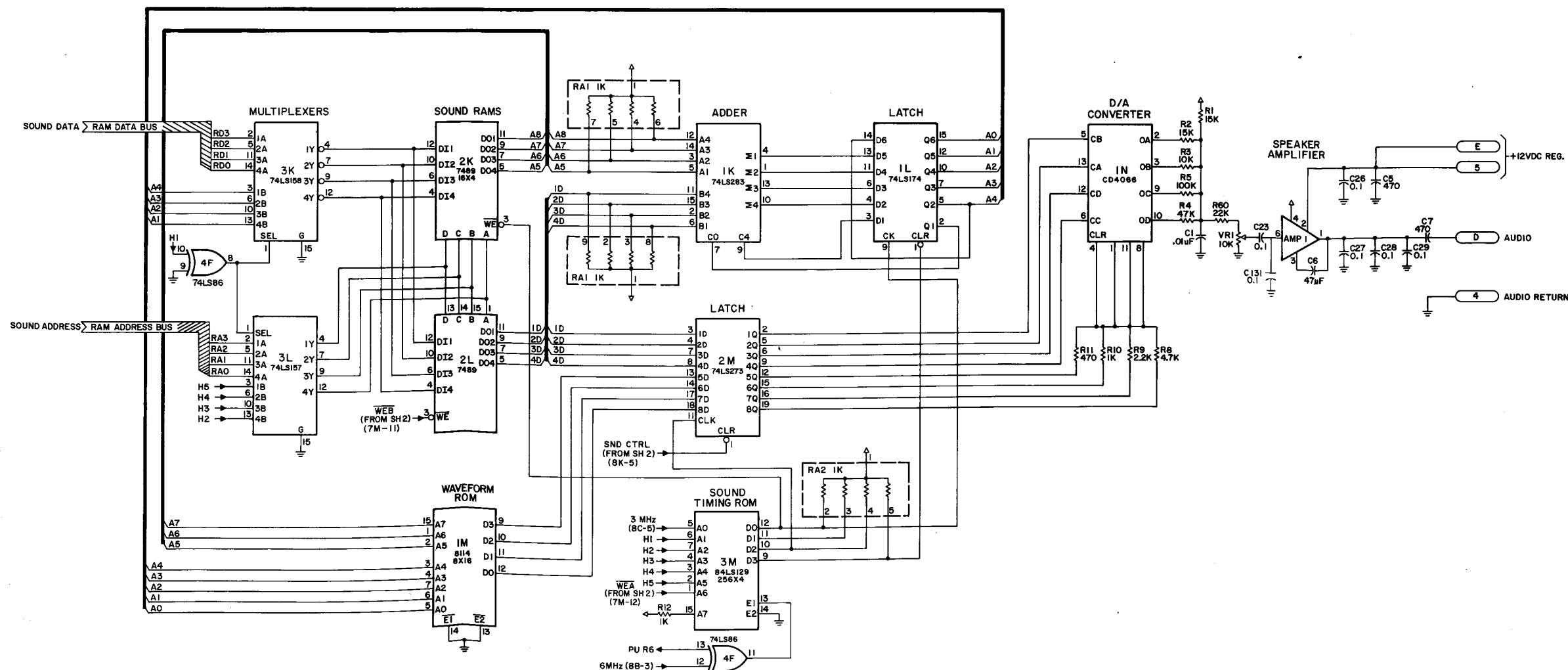
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ITEM NO.	PART NO.	PART DESIGNATION	DESCRIPTION	REQ'D NO.	50	5282-09758-00	7F	ICM/TRX COLOR PROM	1
1	5770-09754-00		BARE P.C. BOARD	1	51	5282-09759-00	1M	ICM/TRX WAVE FORM GENERATOR	1
2	5010-08774-00	R1, R2, 60	RESISTOR 22K 1/4W 5%	3	52	5282-09760-00	3M	ICM/TRX SOUND CONTROL ASM	1
3	5010-08998-00	R9	RESISTOR 22K 1/4W 5%	1	53	5282-09761-00	4A	ICM/TRX VIDEO GENERATOR ASM	1
4	5010-09001-00	R34, R35	RESISTOR 330 1/4W 5%	2	54	5310-09772-00	1N	ICCD4066, 4 A/SW	1
5	5010-09034-00	R3	RESISTOR 10K 1/4W 5%	1	55	5340-09751-00	2A, 2B, 2C, 2D	ICRAM/S 2125AL 1K x 1	4
6	5010-09035-00	R9, R8	RESISTOR 47K 1/4W 5%	2	56	5340-09752-00	4P, 4R, 4K, 4L, 4M, 4N	ICRAM/S 2114-3 1K x 4	6
7	5010-09036-00	R51	RESISTOR 100 1/4W 5%	1	57	A-5343-09762-	5E	ICM/TRX ROM A ASM	1
8	5010-09160	R22, 25, 28, 36-50, 54	RESISTOR 220 1/4W 5%	19	58	A-5343-09763-	5F	ICM/TRX ROM B ASM	1
9	5010-09162-00	R5	RESISTOR 100K 1/4W 5%	1	59	A-5343-09764-	6E	ICM/TRX ROM 1 ASM	1
10	5010-09358-00	R6, 7, 10, 12-20, 24, 25, 27, 29, 30-33, 52, 55, 56, 59	RESISTOR 1K 1/4W 5%	24	60	A-5343-09765-	6F	ICM/TRX ROM 2 ASM	1
11	5010-09416-00	R11, R21, R53	RESISTOR 470 1/4W 5%	3	61	A-5343-09766-	6H	ICM/TRX ROM 3 ASM	1
12	5010-09768-00	R23	RESISTOR 180 1/4W 5%	1	62	A-5343-09767-	6J	ICM/TRX ROM 4 ASM	1
13	5014-09755-00	VR1	VARIABLE RESISTOR 1K 1/2W	1	63	5370-09750-00	AMP 1	IC3712 AUDIO AMP	1
14	5019-09748-00	RA1, RA3, RA4, RA6-RA10	S.I.P. 1K 8R, 5, 5%	8	64	5400-09753-00	GA	I.C. MPU 280A	1
15	5040-09776-00	C3, C4, C5, C7	CAPACITOR, +50-10 470 MFD 16V RADIAL	4	65	5410-09771-00	GP	ICCUSTOM	1
16	5040-09777-00	C30	CAPACITOR, +50-10 10 MFD 16V RADIAL	1	66	5520-09749-00	X1	18.432 MHE CRYSTAL	1
17	5043-08980-00	C1	CAPACITOR .01 MFD 50V +80-20	1	67	5645-09025-00	SD	8 POSITION DIP SWITCH	1
18	5043-09773-00	C8-C22, C26-C29, C100-C130	CAPACITOR .1 MFD 18V +80-20	50	68	5700-08985-00	GA	40 PIN IC SOCKET	1
19	5043-09442-00	C31, C32, C33, C25	CAPACITOR 130 PFD 50V ±10	4	69	5700-09004-00	5F, 5E, 6E, 6F, 6H, 6J, 6P	24 PIN IC SOCKET	7
20	5043-09775-00	C2	CAPACITOR 330 PFD 18V +20-20	1	70	5700-09006-00	1M, 3M, 4A, 7F	16 PIN IC SOCKET	4
21	5280-09530-00	3E	IC7420, DUAL 4 IN NAND	1	71	HW-00030-B		JUMP WIRE WHITE	14"
22	5280-09547-00	7C	IC7427 3 IN NOR	1	72	HW-00030-G		JUMP WIRE WHITE	12"
23	5280-09625-00	2K, 2L, 3F, 3H	IC7489 16 x 4 RAM	4	73	5040-09422-00	C6, C24	CAPACITOR 47MFD 50V +50-10	2
24	5281-09215-00	G81, 15	IC74LS04 HEX INV	2	74	5043-08996-00	C131, C23	0.1 MFD AXIAL 50V 7-20	2
25	5281-09235-00	3P	IC74LS10 3 IN NAND	1	75	5010-08991-00	R61	4.7K Ω, 5%, 1/4W	1
26	5281-09246-00	4S, 5L, 7M	IC74LS139 2-4 DECODER	3	76	5019-09780-00	RA2, RA5	S.I.P. 1K 4R, 5, 5%	2
27	5281-09247-00	2P, 5N1, 7L	IC74LS02 2 IN NOR	3					
28	5281-09308-00	4H, 6C2	IC74LS245 OCTAL TRANSCEIVER	2					
29	5281-09385-00	4S, 8D, 8E, 8F, 8M, 5P1, 6L, 6M	IC74LS367 HEX BUFFER	8					
30	5281-09480-00	8A	IC74LS107 DUAL	1					
31	5281-09484-00	7N	IC74LS42 BCD-DECODER	1					
32	5281-09485-00	5S1, 5P2, 5S2	IC74LS257 QUAD 2-1 MULTX	3					
33	5281-09487-00	3N, 5M, 6C1, 6C	IC74LS74 DUAL	4					
34	5281-09499-00	4C, 6B2	IC74LS00 QUAD 2 IN NAND	2					
35	5281-09733-00	1L, 1H	IC74LS174 HEX F/F	2					
36	5281-09734-00	1K, 1F, 2F	IC74LS283 ADDR 4B	3					
37	5281-09735-00	1E, 2S, 2R, 2E, 3R, 3S, 3C	IC74LS161 BIN CTR	7					
38	5281-09736-00	2M, 4D	IC74LS273 OCTAL F/F	2					
39	5281-09737-	2H, 4F	IC74LS86 QUAD OR	2					
40	5281-09738-00	3B, 3L, 4E, 5A	IC74LS157 MLTPX	4					
41	5281-09739-00	3A, 3K	IC74LS158 MLTPX I	2					
42	5281-09740-00	3C	IC74LS375 LATCH	1					
43	5281-09741-00	4B	IC74LS377 QUAD F/F	1					
44	5281-09742-00	5B, 5C	IC74LS194 SHFT/R	2					
45	5281-09743-00	5D, 7H	IC74LS08 QUAD 2 IN AND	2					
46	5281-09744-00	5R1, 5N2, 5R2	IC74LS258 MLTPX	3					
47	5281-09745-00	7J	IC74LS138 DMLTPX	1					
48	5281-09746-00	8B	IC74LS363 HEX INV	1					
49	5281-09747-00	8K	IC74LS259 LATCH	1					

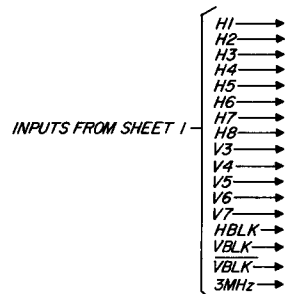
CLOCK CIRCUIT



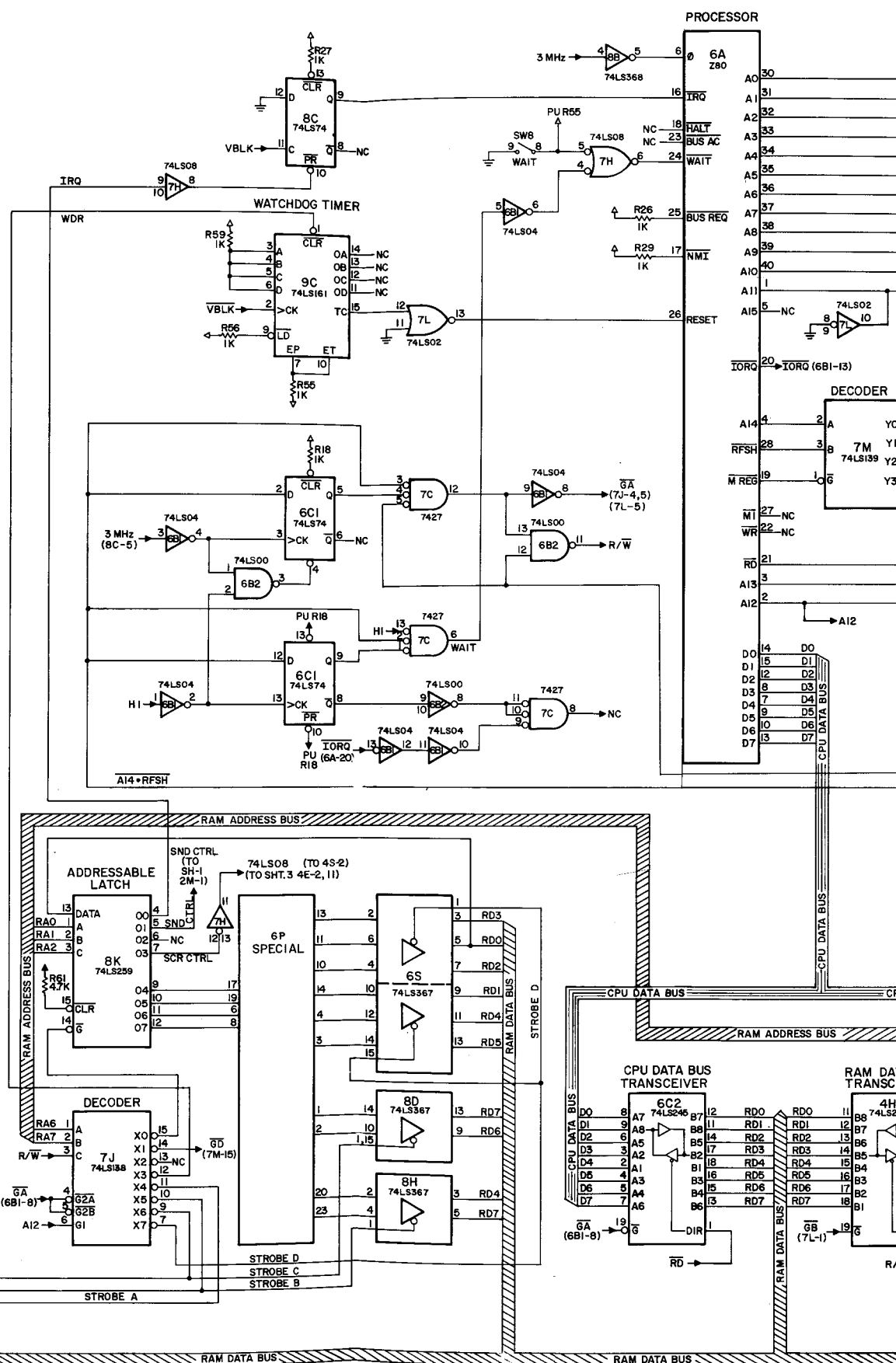
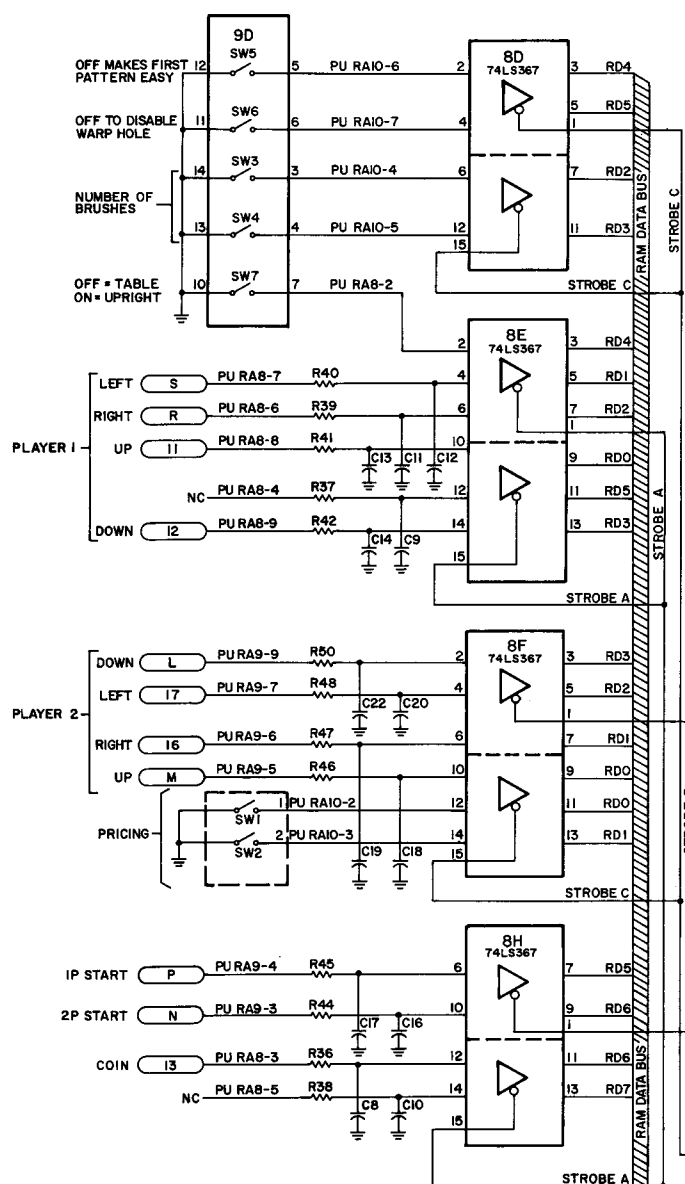
DIVIDERS

SOUND CIRCUIT

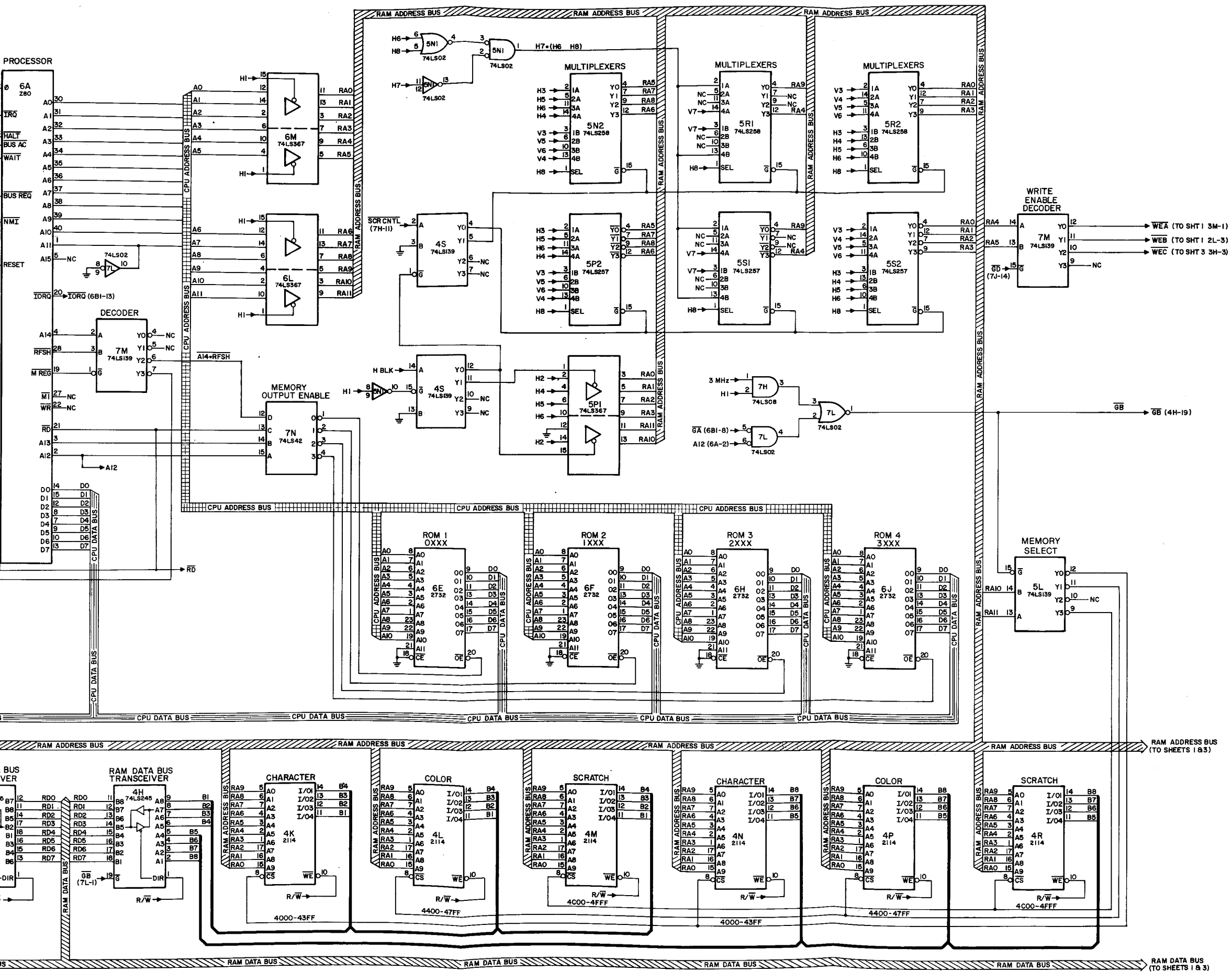




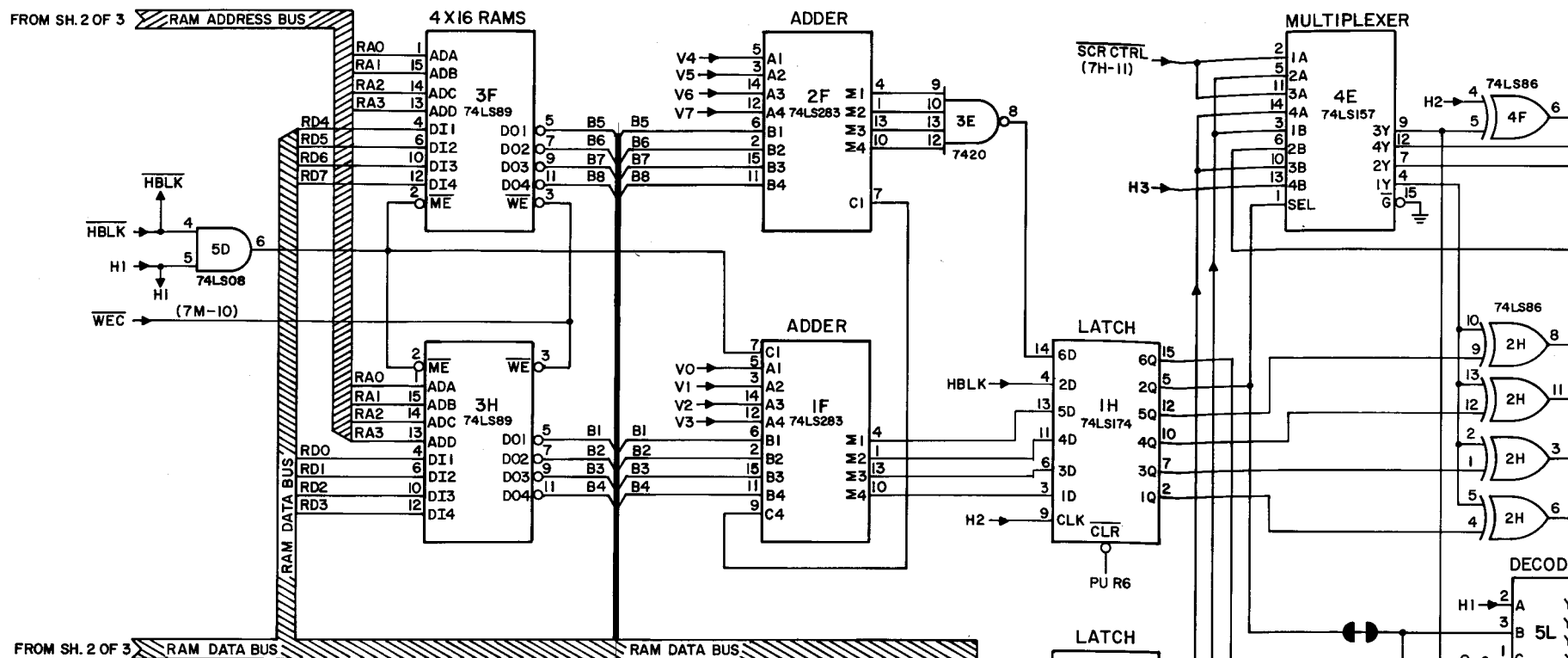
INPUT BUFFERS



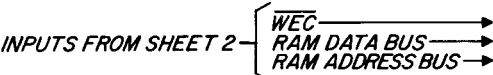
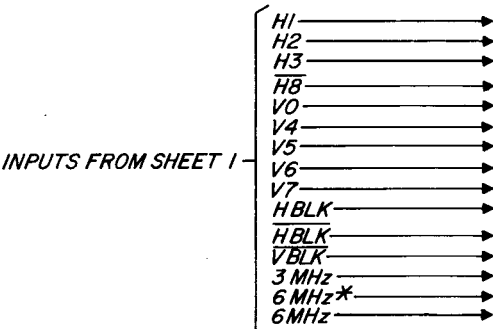
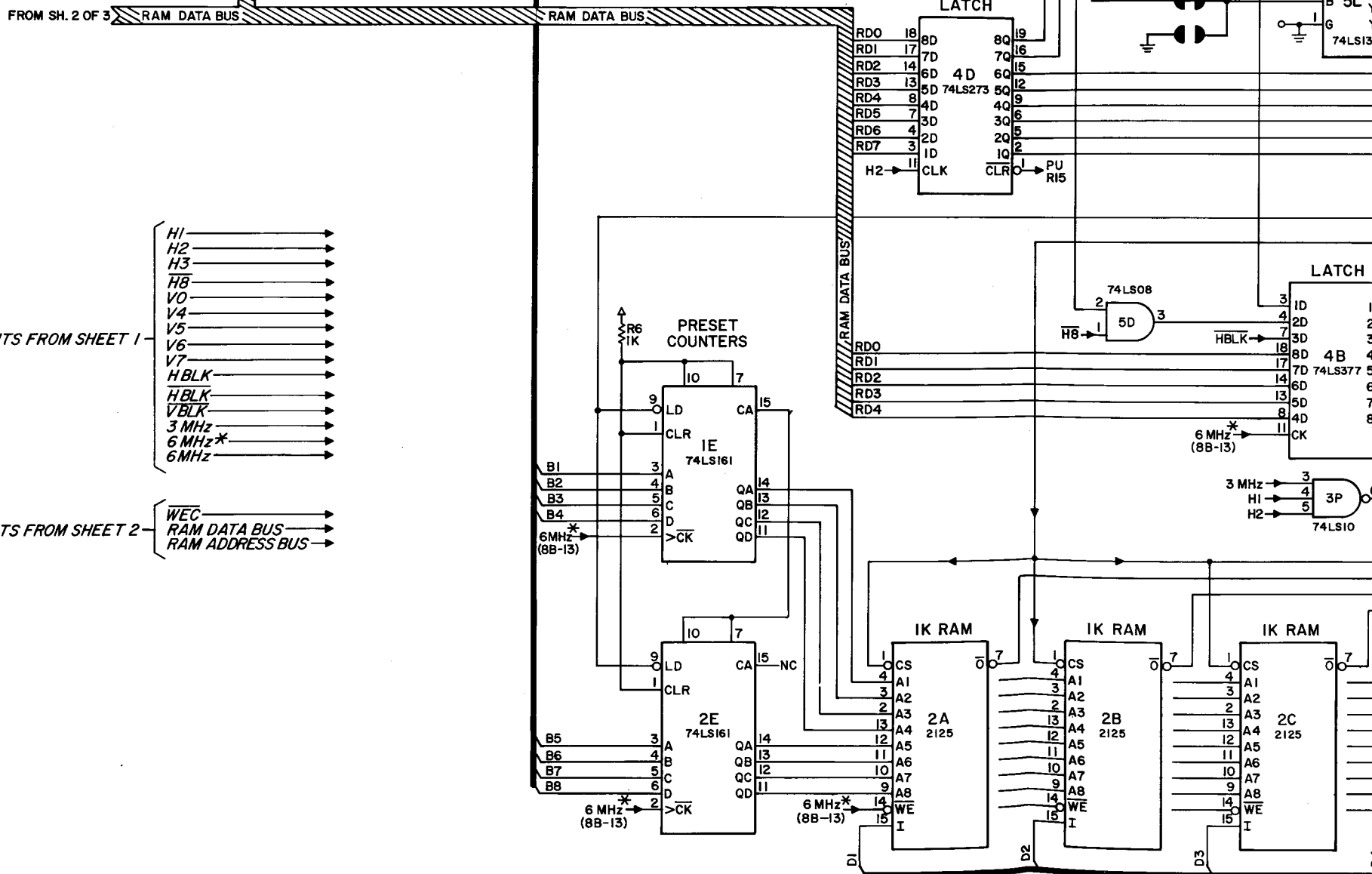
SCREEN DECODING

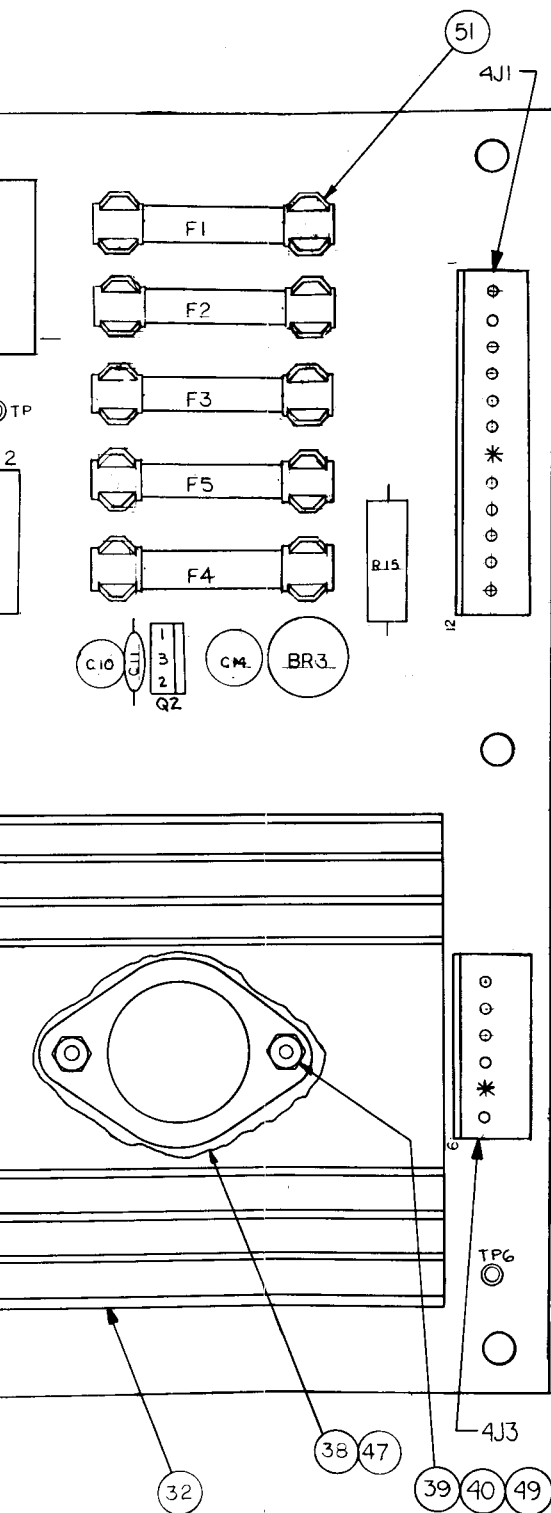


FROM SH. 2 OF 3

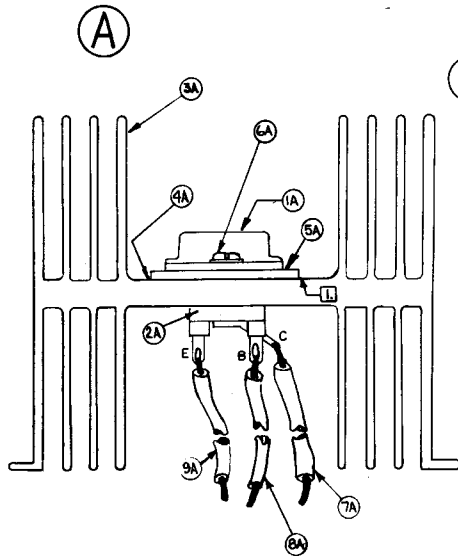


FROM SH. 2 OF 3



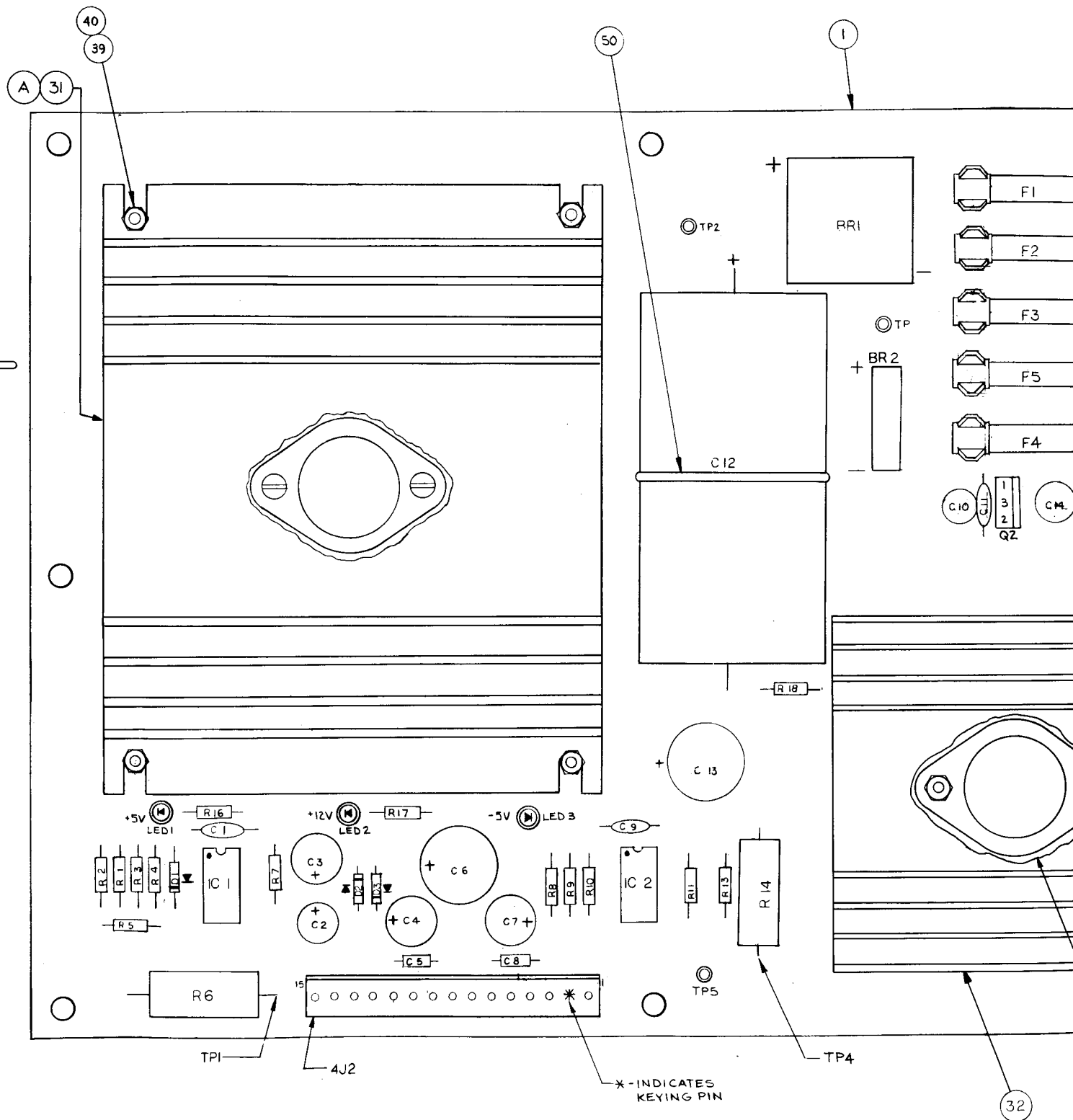


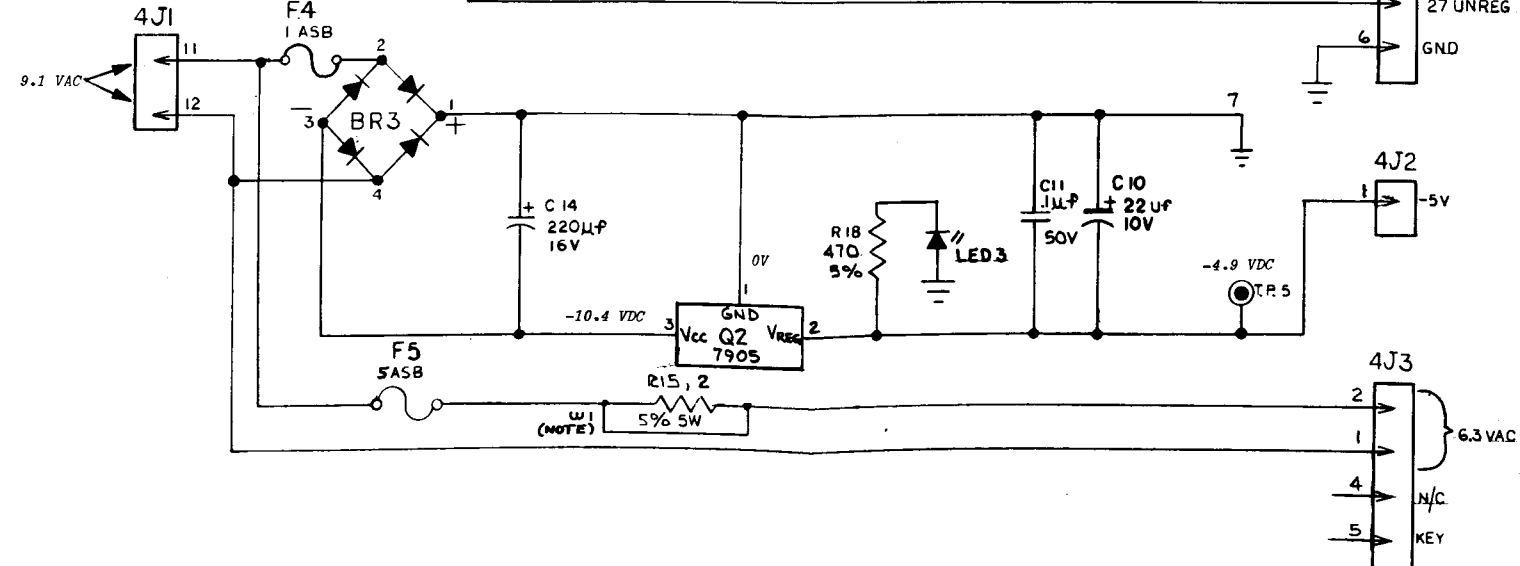
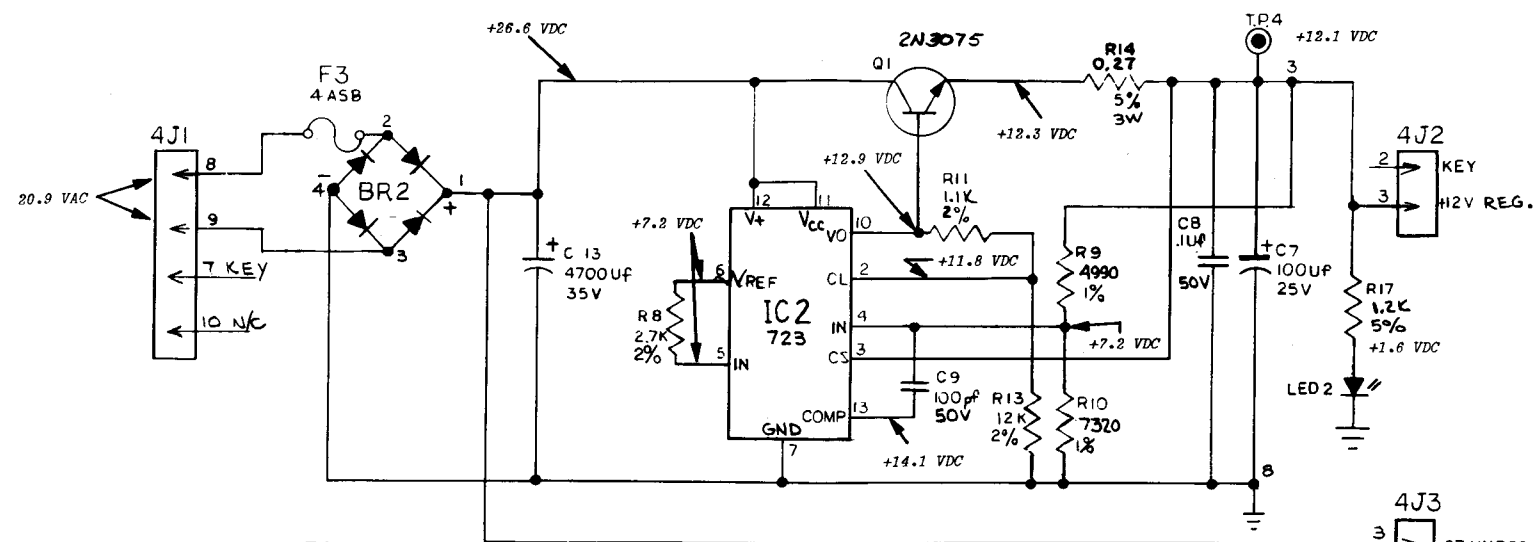
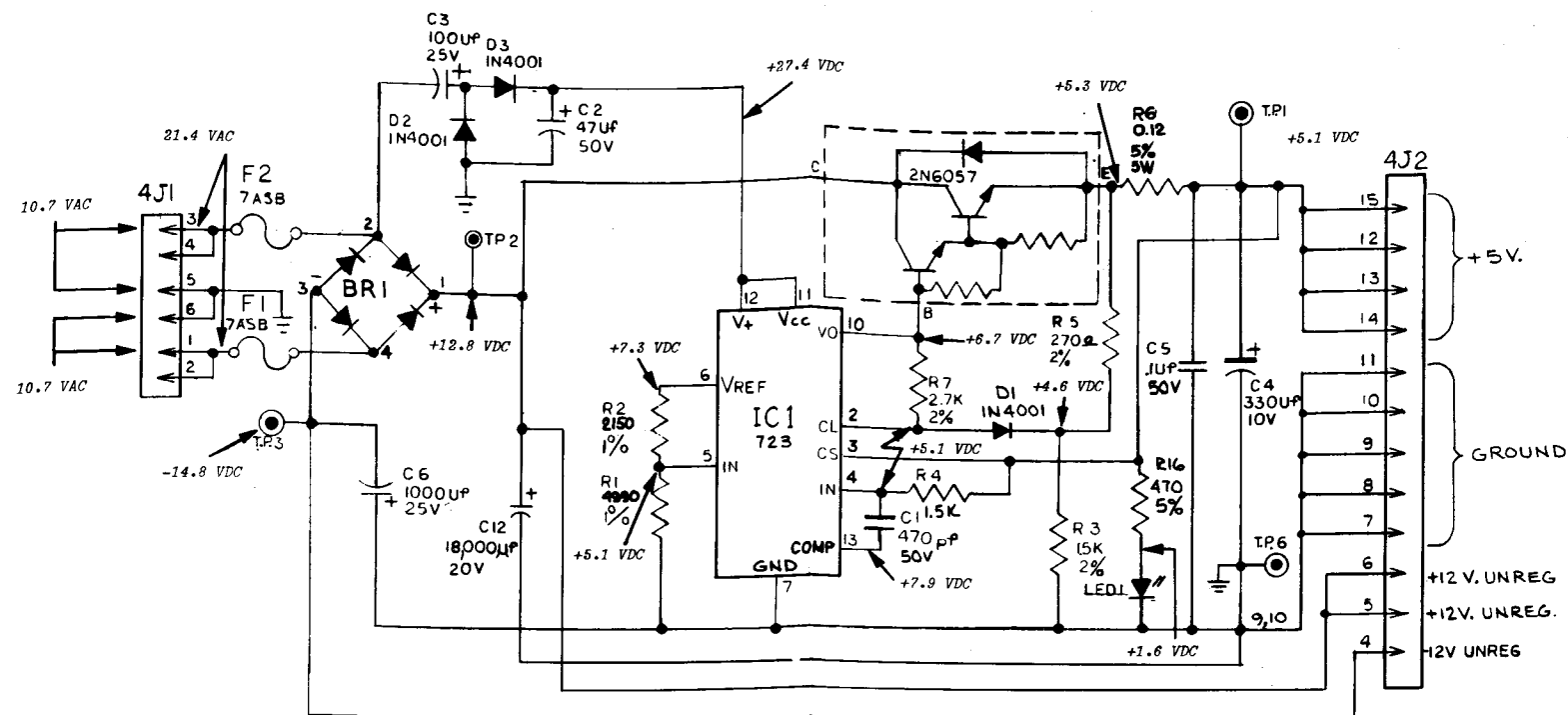
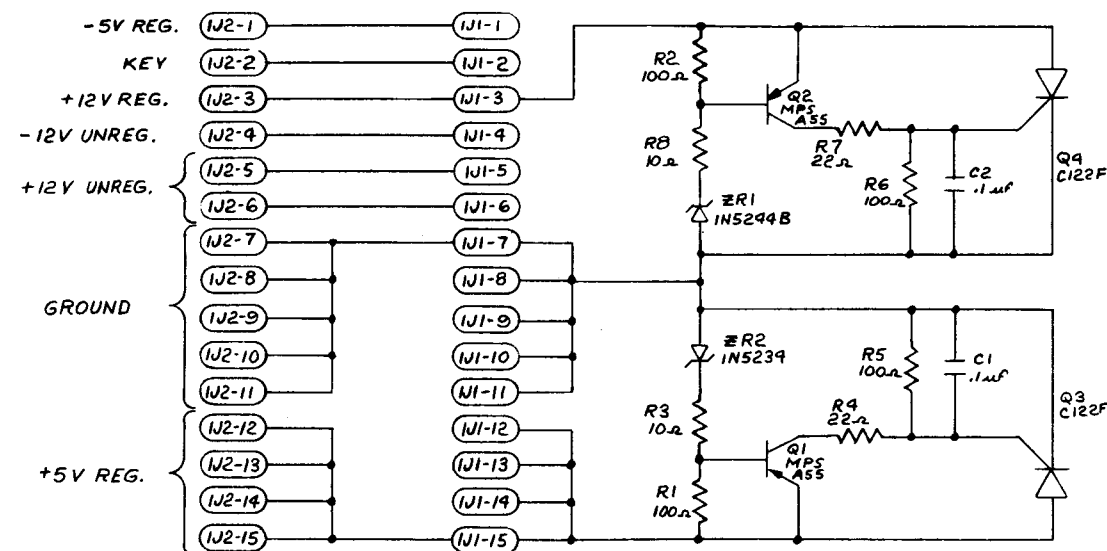
BILL OF MATERIAL				
ITEM NO.	PART NO.	PART DESIGNATION	DESCRIPTION	REQ'D NO.
1	5173-09474-00		BARE P.C. BOARD	
2	5010-09085-00	R4	RESISTOR, 1.5K 5%, 1/4W	1
3	5010-09541-00	R8, R7	RESISTOR, 2.7K 2%, 1/4W	2
4	5010-09508-00	R5	RESISTOR, 270 2%, 1/4W	1
5	5010-09428-00	R3	RESISTOR, 1.5K 2%, 1/4W	1
6	5010-09509-00	R11	RESISTOR, 1.1K 2%, 1/4W	1
7	5010-09510-00	R13	RESISTOR, 12K 2%, 1/4W	1
8	5013-09542-00	R10	RESISTOR, 732K 1%, 1/4W	1
9	5013-09427-00	R1 & R9	RESISTOR 499K 1% 1/4W	2
10	5013-09426-00	R2	RESISTOR 2.15K 1% 1/4W	1
11	5012-09429-00	R6	RESISTOR 12Ω, 5%, 5W	1
12	5012-09512-00	R14	RESISTOR 27 5%, 5W	1
13	5040-09421-00	C3 & C7	CAPACITOR, 100MFD, 25V. RADIAL	2
14	5040-09422-00	C2	CAPACITOR, 47MFD, 50V. RADIAL	1
15	5040-09420-00	C6	CAPACITOR, 1000MFD, 25V. RADIAL	1
16	5040-09419-00	C12	CAPACITOR, 18,000MFD, 20V. RADIAL	1
17	5040-09423-00	C4	CAPACITOR, 330MFD, 10V. RADIAL	1
18	5040-09504-00	C13	CAPACITOR, 4700MFD, 35V. RADIAL	1
19	5043-08994-00	C5, C8, C11	CAPACITOR, 1MFD, 50V. AXIAL RESU	3
20	5043-09065-00	C1	CAPACITOR, 470 PFD, 50V. AXIAL XTR	1
21	5043-09492-00	C9	CAPACITOR, 100 PFD, 50V. AXIAL 52L	1
22	5040-09506-00	C14	CAPACITOR, 220MFD, 16V. RADIAL	1
23	5040-09493-00	C10	CAPACITOR, 22MFD, 10V. RADIAL	1
24	5070-06258-00	D1, D2, D3	DIODE, IN4001	3
25	5100-09418-00	BR1	BRIDGE RECTIFIER, 35AMP, 100V	1
26	5100-09513-00	BR2	DIODE BRIDGE, 4.0A, 50V	1
27	5100-09514-00	BR3	DIODE BRIDGE, 1.0A, 50V	1
28	5731-09432-00	F1, F2	FUSE, 7A, 5B	2
29	5731-06314-00	F3	FUSE, 4A, 5B, 250 V.	1
30	5731-06569-00	F4	FUSE, 1A, 5B	1
31	B-8416-00		HEAT SINK ASSEMBLY (SEE A)	1
32	5705-09543-00		HEAT SINK	1
33	5791-09074-00	4J2	HEADER, 15 PIN, 09-65-1151	1
34	5791-09043-00	4J1	HEADER, 12 PIN, 09-65-1121	1
35	5250-09515-00	Q2	VOLTAGE REGULATOR 7905	1
36	5460-09424-00	IC1, IC2	VOLTAGE REGULATOR 723	2
37	5824-09248-00	TP2, TP3, TP5, TP6	TERMINAL #1502-1 (TEST POST)	4
38	20-9229-00		THERMAL COMPOUND .02 OUNCE	AR
39	4005-01051-07		5-40x2/16 RH. MECH. SCREW	6
40	4405-01112-00		5-40 HEX NUT	6
41	5161-09552-00	Q1	2N3055 TRANSISTOR NPN	1
42	5731-09651-00	F5	FUSE, 5A, 5B	1
43	5791-09038-00	4J3	HEADER, 6 PIN, 09-65-1061	1
44	5012-09544-00	R15	RESISTOR, 2.0Ω, 5%, 5W	1
45	5010-09416-00	R16, R18	RESISTOR, 470Ω, 5%, 1/4W	2
46	5010-09314-00	R17	RESISTOR, 1.2K, 5%, 1/4W	1
47	5701-09538-00		INSULATOR, MICA, 3mil	1
48	5671-09019-00	LED1, LED2, LED3	LED, RED	3
49	03-7598		INSULATOR, NYLON	2
50	03-7520		TIE WRAP	1
51	5732-09178-00		FUSE HOLDER	10



BILL OF MATERIAL			
ITEM NO	PART NO	DESCRIPTION	REQ'D NO.
1A	5162-09425-00	TRANSISTOR NPN 2N6057	1
2A	5700-09445-00	TRANSISTOR-SOCKET T03	1
3A	5705-09431-00	HEAT SINK	1
4A	20-9729-00	THERMAL COMPOUND 1.5 OUNCE	1
5A	5701-09338-00	T03 3 MIL MICA INSULATOR	1
6A	4006-01003-8	MS-6-22x1/2-P-PH	2
7A	5853-09591-00	LEAD WIRE #18 AWG 3/8 STRIPPED (GRN)	1
8A	5853-09592-00	LEAD WIRE #18 AWG 3/8 STRIPPED (WHT)	1
9A	5853-09593-00	LEAD WIRE #18 AWG 3/8 STRIPPED (VEL)	1

NOTES:
 1. HEAT SINK COMPOUND MUST BE APPLIED BETWEEN MICA INSULATOR AND HEAT SINK AND BETWEEN MICA INSULATOR AND TRANSISTOR.

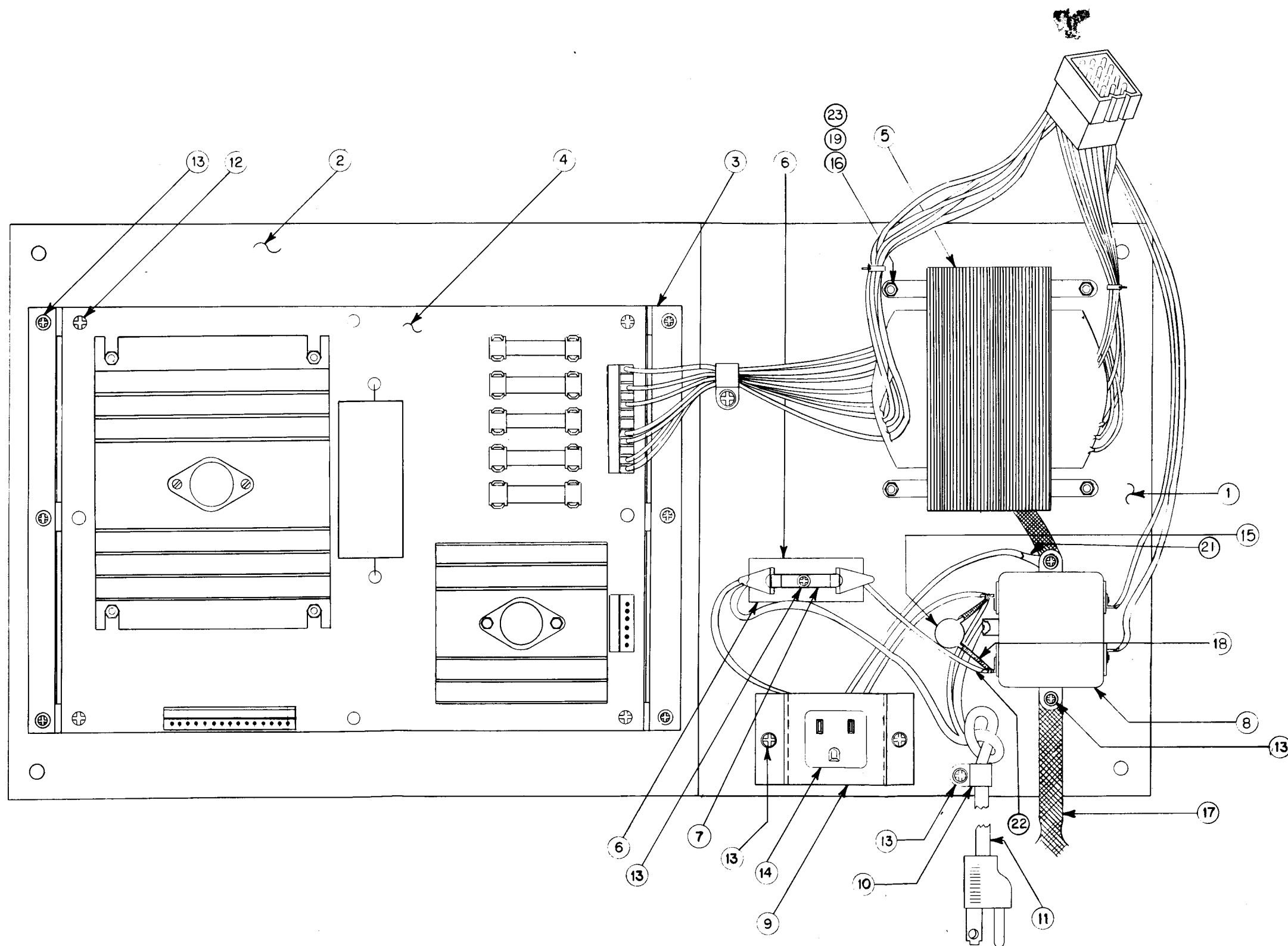




BILL OF MATERIALS				
ITEM NO.	PART NO.	PART DESIGNATION	DESCRIPTION	REQ'D NO.
1	5773-09664-00		BARE P.C. BOARD	1
2	5792-09676-00	IJ1	RIGHT ANGLE CONNECTOR, 15 PIN	1
3	5791-09670-00	IJ2	HEADER CONNECTOR, 15 PIN	1
4	5705-09663-00		HEAT SINK, AAVID 5741	2
	5705-09688-00		HEAT SINK, THERMALLOY 6093	0
7	5130-09661-00	Q3, Q4	SCR 122F (100V)	2
8	5190-09430-00	Q1, Q2	TRANSISTOR MPS A55	2
9	5075-09662-00	ZR1	ZENER IN5244 ± 5% (14V)	1
10	5075-09406-00	ZR2	ZENER IN5239 ± 5% (6.2V)	1
11	5010-09036-00	R1, R2, R5, R6	RESISTOR C.F. 100 Ω ± 5% 1/4W	4
12	5010-09039-00	R3, R8	RESISTOR C.F. 10 Ω ± 5% 1/4W	2
13	5010-09434-00	R4, R7	RESISTOR C.F. 22 Ω ± 5% 1/4W	2
14	5043-08996-00	C1, C2	CAPACITOR 0.1 μF CERAMIC +80%-20% 50V	2

NOTES:
1. OBSERVE POLARITY OF CAPACITORS, DIODES AND POSITION OF TRANSISTORS.
2. REFERENCE DWG: SCHEMATIC 16-8810

NOTE:
W1 CONNECTED ONLY FOR COCKTAIL APPLICATIONS.



BILL OF MATERIALS			
ITEM	PART N°	DESCRIPTION	QTY.
1	11-580	POWER SUPPLY MTG. BD.	1
2	01-7001	POWER SUPPLY GND PLATE	1
3	01-7002	POWER SUPPLY SUPPORT BRKT.	2
4	D-8359	POWER SUPPLY BOARD	1
5	C8529	VIDEO TRANSFORMER ASSY	1
6	B-6448-1	FUSE MOUNT ASS'Y.	1
7	5731-08633-00	LINE FUSE 3AMP 115V	1
8	5102-08895-00	LINE FILTER 5A	1
9	01-6948-	OUTLET MTG BRACKET	1
10	03-6048-6	CABLE CLAMP- 3/8	2
11	SEE NOTE #2	LINE CORD	1
12	4006-01018-04	MS. #6-32 x 7/4 P-RH	4
13	4108-01022-08	SMS #8-32 x 1/2 P-RWH-A	13
14	5851-09184-00	3WIRE SNAP-IN OUTLET	1
15	SEE NOTE #1	VARISTOR	1
16	4408-01117-00	NUT 8-32 HEX	4
17	20-9223-3	6INCH BRAIDED GROUND WIRE	1
18	20-9256	1 INCH SLEEVING INSULATION	2
19	4703-00008-00	NO#8 EXTERNAL LOCK WASHER	4
21	5825-06523-00	TERMINAL LUG	1
22	5852-09575-00	BLACK-18 AWG JUMPER WIRE-25'	1
23	4008-01005-22	MS. 8-32 x 1 3/8 P-PH	4

NOTES:

1. FOR 115V.A.C., 130V. VARISTOR* 5017-09044 IS USED.

FOR 230V.A.C., A 275V VARISTOR* 5017-09063 IS USED.

2. LINE CORD PART NUMBERS:

5850-06206-00 12 FT. EUROPE
5850-08728-00 U.S. DOM.
5850-08737-00 AUS.
5850-08743-00 U.S.L.A.
5850-09128-00 12 FT. FRANCE
5850-09131-00 AWG 18-12 JAPAN

